

Peer Review

A response from the Society of Biology to the House of Commons Science and Technology Committee inquiry into Peer Review

10th March 2011

The Society of Biology is a single unified voice for biology: advising Government and influencing policy; advancing education and professional development; supporting our members, and engaging and encouraging public interest in the life sciences. The Society represents a diverse membership of over 80,000 - including practising scientists, students and interested non-professionals - as individuals, or through the learned societies and other organisations listed below.

Summary

- Peer review is an essential and integral part of the international scholarly endeavour with particular importance in the life sciences and medicine. It contributes to decisions about research funding, assessment and publication and acts as a key test of scientific novelty and soundness.
- Even UK-based journals typically have only a small minority of their readers, authors and reviewers based here and UK researchers frequently submit their work for publication in journals based outside of the UK. Many of the most prestigious journals in biology are those published by the US specialist societies. It is important that requirements placed upon UK researchers should not affect their ability to publish in these leading journals when their research is of sufficient quality.
- Evolutionary improvements to review systems are made regularly and further improvements within the spirit of the system would be embraced, but it is important not to disrupt a system which is effective and engages the enthusiasm and trust of the scientific community. The Society of Biology does not envisage any valid alternative to the peer review framework.
- Greater recognition of the value of the peer review 'quality stamp' amongst students and the public would be welcomed and could contribute to public debate of science issues.
- Many reviewers give their time for free to act as peer reviewers. There is debate about the potentially positive or negative impacts of introducing a reviewer payment system on quality, legitimacy, fairness, participation and the cost of journals.
- Through their publication activities, member societies of the Society of Biology inject substantial financial resources back into UK academia. Studies have indicated that the value of their published journals contributed more than double their subscription revenue into the UK biosciences research community.
- Peer review does not just involve making an assessment of quality; it also improves and drives up standards by broadening the intellectual input to projects. Most articles are improved by the authors after initial peer review. Peer review is therefore not just a filter, but an active and positive influence on the progress of science.

Overall comments about peer review

1. The Society of Biology welcomes this review and the opportunity it affords to record some specific comments on the operation and significance of peer review.
2. Peer review is an important expression of both the independence of scientists and of the essential norms of scientific behaviour which seek to ensure rigour and originality. As a process it has many inspirational characteristics, particularly because it is collective and benefits from voluntary contributions of time and expertise to promote and police excellence. It is practiced with slight differences by different journals and review bodies and while not infallible its benefits, potential, and the degree of trust which it currently commands, make it an exceptionally valuable component of scientific endeavour.
3. Any system for filtering, improving and quality stamping scholarly research outputs needs to meet the needs of researchers themselves, as they are also (largely) its consumers. They form the community that is best qualified to assess the merits or otherwise of any alternative systems. Other stakeholders including university administrators/managers, research funders including government, and publishers may have a contributory role in proposing and testing various models.
4. Public and other funders will wish to be satisfied that the demands that peer review places on the time and resources of the researchers they support are cost effective. A recent attempt to cost the elements of the system has concluded that much of the time contributed by reviewers is uncoded personal time¹. This is a complex issue.
5. There is no separate compartmentalised UK-based peer review system. It is a fully integrated global system. Even UK-based journals typically have only a minority of their readers, authors and reviewers based here. UK researchers do not usually use geographical location of the journal as a factor in selection of publication for their research outputs and, therefore, frequently submit their work for publication in journals based outside of the UK. In many biological disciplines, the most prestigious journals are those published by US specialist societies. It is important that requirements placed upon UK researchers should not affect their ability to publish in these leading journals when their research is of sufficient quality.
6. The peer review system within publishing is usually managed and administered by learned societies or their contracted publisher, and overseen by academic editors and editorial boards appointed by the societies themselves. Learned societies, such as those represented by the Society of Biology, are therefore often central to this element of the peer review process. Peer reviewed publication is particularly important within the biological and medical sciences.
7. In addition, the principles of peer review are also used to assess grant funding proposals, occasionally the reports of work during a funded period, and the output of research institutions under the Research Assessment Exercise (and soon the Research Excellence Framework). In the latter exercises, and for many grant-funding bodies, large expert panels are convened which examine a

¹ Analysis of the external costs of peer review. Available at www.rcuk.ac.uk/documents/documents/prdtz.pdf

large, comparative group of submissions (or independent reviewer comment on them) whereas for journal publication the review is on a case-by-case basis and the reviewer will rarely see, over a year, anything like the volume of material passed to funding or REF reviewers. However in this way peer review has a gate-keeping role at several points in the evolution of fields of scientific investigation and potentially involves a significant number of independent reviewers.

8. Most scholarly journals use a single-blind system in which each submission (including the authors' names and affiliations as submitted) is sent to at least two, but often three to five independent expert referees/ reviewers whose identity is not revealed to the authors or subsequent readers. However, some journals are experimenting with alternative systems.
9. Reviewers are tasked to assess the quality of the submitted article against agreed criteria² and usually offer their services at no charge to the journal or its society owner or publisher. Academics traditionally consider that acting as a reviewer is part of their duty to the global scholarly enterprise, because they recognise that they benefit from it when they seek to publish, and they gain experience and reputation including internationally. There is some concern that introducing reviewer payments could act against quality or perceived legitimacy, however, uncompensated time commitment may be a prohibitive barrier to some potentially valuable reviewers. This remains an area of debate.
10. A study³ in 2008 found that, if institutions were to charge publishers/journals/societies for the use of their faculty's time as reviewers, journals would need to increase their prices by 43% to cover their costs. It would also introduce further administrative overheads into institutions and greater bureaucratic burdens on researchers in tracking and reporting on the use of their time.

The strengths and weaknesses of peer review as a quality control mechanism for scientists, publishers and the public

11. A study⁴ has found that the vast majority (85%) of academics believe that peer review greatly helps scientific communication.
12. Member societies of the Society of Biology inject substantial financial resources back into UK academia. Before its recent formation from a merger between the Biosciences Federation and the Institute of Biology, a study⁵ for the former Federation found that its member societies that published journals contributed more than twice the sum to the UK biosciences research community that they receive in journal subscription revenue. The involvement of UK academics in reviewing for UK-based society-owned journals is in this way cost effective for the UK academic community.

² Typically reviewers are charged to assess a script for: technical and methodological soundness (including statistical validity); clarity of presentation, including full detail of methods and results (without redundancy); novelty; an interpretation of results that is logical and examines all possible explanations; consistency and sound judgement in presentation of conclusions; acknowledgement of unresolved issues, and significance in relation to important scientific or practical questions.

³ Activities, costs and funding flows in the scholarly communications system in the UK: Report commissioned by the Research Information Network (RIN) 2008 <http://www.rin.ac.uk/our-work/communicating-and-disseminating-research/activities-costs-and-funding-flows-scholarly-commu> page 65

⁴ Ware M 2008 Peer review: benefits, perceptions and alternatives. PRC Summary Papers 4. <http://www.publishingresearch.net/documents/PRCsummary4Warefinal.pdf> page 15. See also conclusions page 20.

⁵ Thorn S, Morris S and Fraser R (2009) Learned societies and open access: key results from surveys of bioscience societies and researchers *Serials* **22** (1) 39-48 (Mar 2009) [DOI:10.1629/2239](https://doi.org/10.1629/2239)

13. The 'short-hand' quality stamp that each journal gains through academics' judgement of its quality saves them time by focusing their main reading on this material.
14. It is particularly important for students and early-career researchers to be able to distinguish articles that are peer-reviewed (and therefore have a higher probability of quality and accuracy) from material that has not been reviewed and therefore needs to be handled with care.
15. Peer review is of special importance for medical information, helping to reduce the risks of doctors acting on incorrect information.

The value and use of peer reviewed science on advancing and testing scientific knowledge

16. Peer review does not just involve making an assessment of quality. In many biological disciplines, few articles are accepted as initially submitted. Most articles are improved by the authors after initial peer review – sometimes involving major changes such as additional experiments – so that the peer-review system contributes to higher quality publications. Peer review is therefore not just a filter, but an active influence on the content and quality of publications.
17. Similarly, many societies and publishers have invested in the CrossCheck system to detect plagiarism. This system is itself the result of cross-publisher collaboration, and is usually implemented as part of the peer review workflow, integrated with online submission and peer review systems. Peer review itself frequently identifies plagiarism and other unethical or fraudulent practices.

The value and use of peer reviewed science in informing public debate

18. Public debate needs to be based on material that has been assessed as being of high quality. It is perhaps important that the public's awareness of this be increased. Sense About Science have made some efforts in this direction. In their document 'I don't know what to believe ... making sense of science stories'⁶, aimed at assisting the general public to understand which statements about science to trust, they say "Peer review can help you make sense of science stories as it tells you that the research has passed the scrutiny of other scientists and is considered valid, significant and original".
19. The appearance of scientific data in peer reviewed publications is generally regarded as a quality assurance in public debate. Similarly, the non-appearance of some arguments in the peer reviewed literature is often quoted as indicative of their weakness, including proponents of homeopathy and opponents of anthropogenic climate change, among others.

The extent to which peer review varies between scientific disciplines and between countries across the world

20. Peer review varies between disciplines in style, time taken and importance placed upon it by researchers and educators in the discipline. The Society of Biology is concerned only with peer review on the biological sciences, including biomedical research, and in these fields peer review is considered to be of the utmost importance.

⁶ "I don't know what to believe ... making sense of science stories", Sense about Science 2005, <http://www.senseaboutscience.org.uk/pdf/ShortPeerReviewGuide.pdf>

21. Journals are largely global, so the major international journals are unlikely to have significant geographical variations in peer review quality or timeliness, although there may be differing preferences for software and systems to achieve this.
22. Most publishers that charge submission fees have systems to waive these for authors in developing countries. However, most UK and other European publishers don't charge submission fees. Most journals do review the geographical spread of submissions and acceptance and would consider reasonable measures to remove barriers to authors and improve their access to international peer review and the scrutiny benefit which this brings.

The processes by which reviewers with the requisite skills and knowledge are identified, in particular as the volume of multi-disciplinary research increases

23. By definition, peer review involves those with similar skill levels and areas of interest to the authors of papers. Close liaison between editorial boards, associated learned societies, or their publishers, has led most journals to develop substantial databases of researchers and their areas of expertise. These databases, alongside other resources such as, for example PubMed, MEDLINE or ISI can be used to help identify suitable researchers. Much biological research is now multi-disciplinary and no problems with handling the peer review for this have been reported to us.

The impact of IT and greater use of online resources on the peer review process

24. Investment by societies and publishers in online systems and improved efficiencies in the internal procedures operated by their staff, coupled with very proactive management of the systems, has resulted in decreasing peer review times. Many leading journals now have times from submission to first decision of only two or three weeks. Electronic communication has contributed to the globalisation of the peer review process.

Possible alternatives to peer review

25. Peer review is an international exercise in the publication sphere. In the review of research outputs from institutions and sectors a peer review-based national and international benchmarking exercise is common (e.g. the REF). Alterations of trust, or access to the operation of peer review in any one of these spheres would have implications for the others, and therefore, the global science enterprise. Evolutionary changes and improvements in systems of peer review are continual and within the spirit of the process as a driver of quality. Ongoing support for these aims and scrutiny of operating systems are a valuable contribution but the Society does not recognise any valid alternative to the peer review framework.

Conclusion

26. In the biological and biomedical communities, peer review is considered to be extremely important, especially as a guarantor of quality and originality.
27. The Society of Biology would welcome the UK government's assistance to developing countries to enable them to implement state-of-the-art peer review systems for their own journals and also provision of training in use of scientific English and writing of scientific papers to scientists in

developing countries to assist them to improve their success rates in acceptance by high-ranking journals' peer review systems.

28. The Society of Biology welcomes initiatives from the UK government to improve public awareness of the need to question the validity of 'science' information and the role of the peer-review 'quality stamp' in this.
29. The Society of Biology is aware of the helpful submission to this inquiry from the Association of Learned and Professional Society Publishers (ALPSP) to which a number of its Member Organisations belong. In preparing this response the Society has received comments from individual and organisational members, notably the Society for Endocrinology and the Society for Applied Microbiology.

The Society of Biology is pleased for this response to be publicly available and will shortly place a version on www.societyofbiology.org . For any queries, please contact Dr Laura Bellingan, Society of Biology, Charles Darwin House, 12 Roger Street, London WC1N 2JU. Email: policy@societyofbiology.org

Member Organisations represented by the Society of Biology

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